



NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

FACT SHEET

(Pursuant to NAC 445A.874)

Project Name: **San Emidio Geothermal Power Plant**

Permittee: **USG Nevada LLC**

Permit Number: **UNEV87041**

Other related discharge permits: NEV94003, NEV99013, TNEV96008, TNEV98029, TNEV99118, TNEV99119, TNEV2000382.

A. Description of Discharge

Location: Six (6) injection wells located in Sections 16 and 21, T.29N., R.23E., San Emidio Desert, Washoe County, Nevada. Discharges to basins at the wellsite and other locations near plant may occur under this permit.

Characteristics: Discharges include injectate consisting of geothermal fluids derived from the San Emidio Desert geothermal reservoir on the east side of the valley, and discharges of geothermal fluids to basins. The geothermal fluid has a total dissolved solids concentration of approximately 4,500 mg/l, and elevated levels of sodium (1,400 mg/l), chloride (2,320 mg/l), boron (6 mg/l), and fluoride (5 mg/l) are present. Any chemical treatment for scale or corrosion will require approval by the Division prior to use. (Note: Cooling water blowdown ranges of TDS (1600-2400 mg/l), pH (8.3-8.8), chloride (600-850 mg/l), fluoride (0.75-1.5 mg/l), boron (1.2-2.0 mg/l).)

Production temperature: 280-305 degF

Injection temperature: 185-210 degF

Injection rate : 4000 gpm (2000 average)

B. Synopsis

2013 Status and Renewal

September 2013 Renewal -

1. Production wells in service - 75-16, 75B-16, 76-16 (61-21, 65C-16)
2. Injection wells in service - 42-21, 43-21, 53-21 (35-21, 45-21, 51-16, 52-21)
3. Surface discharge to help production under NS0094003
4. Cooling tower blowdown approximately 5,000,000 - 10,000,000 per month, to private land north of plant.

September, 2009 - three injection wells in service.

May 2009 - Notice of Violation - MITs

2009 - US Geothermal Nevada LLC purchased old dehydration plant and use as office space

September, 2008 - Request to postpone renewal of permit - future development

April 29, 2008 - UNEV87041 transferred from Empire Geothermal Power LLC to USG Nevada



LLC

2004 - dehydration plant was taken offline

2000 Status

Empire Energy, LLC (Empire Group, LLC is the parent company) currently owns and operates the Empire Geothermal Power Plant in Section 21, Township 29 North, Range 23 East, MDBM, Washoe County, Nevada. Empire Group is also the parent company of Empire Foods, LLC, the owner and operator of the garlic and onion dehydration plant in Section 16, T29N R23E, approximately one (1) mile north of the power plant.

Prior to 1997, the power plant, the dehydration plant, the geothermal resource on the private lands in Sections 16 and 21, and the geothermal leases on the public lands in Section 21 were previously owned or controlled by unrelated entities. AMOR II Corporation previously owned the power plant, and San Emidio Resources owned and operated the geothermal well field on private lands by the dehydration plant. At this time, all are owned or controlled by Empire Group, LLC. UIC permit UNEV87041 was previously held in the name of Amor II Corporation, and the expired injection permit UNEV94211 was held in the name of San Emidio Resources. Recently the permittee requested the above name change (Empire Energy, LLC) for financing reasons. Bonding requirements were met prior to the name change. In this renewal application, Empire Group, LLC has requested to combine the two permits into permit UNEV87041 to operate the wellfield as one entity in the name of Empire Energy, LLC.

Geothermal production for both facilities is primarily from wells near the dehydration plant on private lands in Section 16 (as of 6/2000 - 75-16, 75B-16, 76-16 and 65C-16 (shut-in)), with some production from the power plant field (currently 52-21). Approximately 500 gallons per minute (gpm) of geothermal fluid (from PW 75B-16) is utilized in the dehydration plant as a heat source for the dryers. The fluid is then mixed with additional geothermal fluids for a total flow of approximately 900 gpm to the wetlands west of dehydration plant and 200 gpm to injection well 51-16. 3500-4000 gpm is produced from the other wells and piped to the power plant to the south. Geothermal fluid is piped through a heat exchanger at the power plant and injected into injection wells (listed below) within a shallower, cooler geothermal zone near the power plant of similar water quality.

In addition to the five (5) injection wells near the power plant, an additional injection well (51-16) is maintained near the dehydration plant for use when the power plant is not operating, or when the flow from the dehydration plant is not needed at the power plant.

Cooling water blowdown from the power plant is currently discharged to the surface on private land north of the power plant or will be used for irrigation. Water used for cooling at the power plant and potable water for the dehydration plant is supplied from a potable water well located approximately 4.5 miles northwest of the facilities, just south of Empire Farms, in Section 36, T30N R22E. The only wells known to exist in the area of review are associated with geothermal development.

Geologic reports of the area indicate geothermal fluids naturally migrate westward to the playa from the east side of the valley (Water Resources Reconnaissance Series Report #44,

April 1968) and commingle with ground water recharge to the playa principally from the west side of the valley. Geothermal fluids migrate up the fault system of the east side of the valley, and naturally discharge into the valley fill material at varying depths. No fresh water aquifers have been identified in the project area and the shallow ground water is similar in quality to the geothermal fluids.

Injection wells as of September 2009/2013 - 42-21, 43-21, 53-21

Injection wells as of May 2000

The following table outlines the injection wells presently in use or proposed for use.

Well	Location T29N R23E	Depth	DOM#	Injection Interval	Max Inj Press
51-16	NE1/4NW1/4 SEC. 16 40 <input type="checkbox"/>	993 ft	280	102'-993' (WL - 23')	30 psig
42-21	NE1/4NW1/4 SEC. 21 40 <input type="checkbox"/>	800 ft	161	250'-800'	56 psig
43-21	SE1/4NW1/4 SEC. 21 40 <input type="checkbox"/>	320 ft	107	85'-320'	22 psig
45-21	NE1/4SW1/4 SEC. 21 40 <input type="checkbox"/> 21"	800 ft	164	101'-800'	
35-21	SEC. 21	306 ft	163		
53-21	SEC. 21	350 ft	187		

*LATITUDE AND LONGITUDE DERIVED FROM USGS 71/2 MINUTE QUADRANGLE SHEETS, SAN EMIDIO DESERT NORTH AND SAN EMIDIO DESERT SOUTH.

C. Receiving Water Characteristics

The produced geothermal fluid is injected back into the same or similar reservoir (see Part A above). Ground water at all depths surrounding the project is of geothermal nature or influence and poor quality, evident by hot springs, mud pots and fumaroles surrounding the facility. Shallow holes have been dug near power plant and dehydration facility and the ground water is of similar quality to the geothermal fluids. Shallow aquifer water quality is generally poor consisting of total dissolved solids (4,600 mg/l), fluoride (5.10 mg/l), boron (6.0 mg/l) and chloride (2,410 mg/l).

D. Procedures for Public Comment

The Notice of the Division's intent to modify and reissue a permit authorizing the facility to inject into the ground water of the State of Nevada subject to the conditions contained within the permit, was sent to the *Reno Gazette-Journal* for publication no later than September 25, 2013. The notice was mailed to interested persons on our mailing list (see Attachment 1). Anyone wishing to comment on the proposed permit modification can do so in writing for a period of 30 days following the date of the public notice.

All written comments received during the comment period will be retained and considered in the final determination. A public hearing on the proposed determination can be requested by the applicant, any affected state, any affected interstate agency, the regional administrator of EPA or any interested agency, person or group of persons.



STATE OF NEVADA

Department of Conservation & Natural Resources

DIVISION OF ENVIRONMENTAL PROTECTION

Brian Sandoval, Governor

Leo M. Drozdoff, P.E., Director

Colleen Cripps, Ph.D., Administrator

Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determines to be appropriate. All public hearings will be conducted in accordance with NAC 445A.238.

The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445A.605.

E. Proposed Determination

The Division has made the tentative determination to modify and reissue the permit contingent upon comments received during the public comment period. If no significant negative impacts due to injection are identified during this process, it is the intent of the Division to reissue the permit.

F. Proposed Effluent Limitations and Special Conditions

See Part I.A of the permit.

G. Rationale for Permit Requirements

Verification that the quality of fluid discharged to the injection well(s) remains constant.
Confirmation that fluids disposal does not adversely affect the existing hydrologic regime.

Prepared by: Russ Land

Date: September 2013